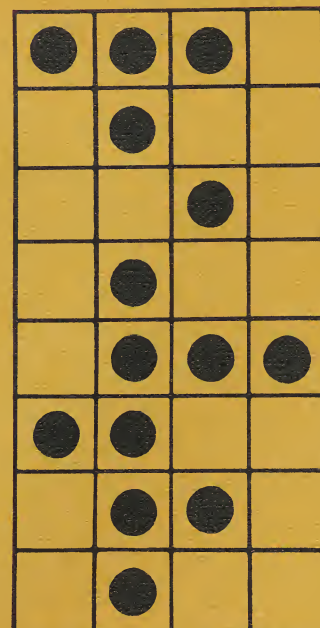




SYS

The people who design better hardware
because they know software.
And vice versa.

Corporate background and philosophy



SYS Computer Corp., Inc., formed in January, 1967 is an independent, publicly held computer hardware/software firm specializing in the analysis, design, and fabrication of computers and computer-related products and systems.

The SYS team consists of senior engineers, systems analysts, and programmers with many years of experience in all aspects of the design and development of computer products and computer-based systems.

The SYS team is unique in that it has hardware/software expertise in both small and large scale computers.

With more than two dozen patents on new concepts and equipment, the SYS staff has a proven record of accomplishment in both the hardware and software fields.

The distinguished records and extensive technical capabilities of the SYS staff are supplemented by another vital quality—the ability to work as a cohesive team in implementing hardware/software solutions to computer system problems and in product development.

This team is led by the founders and principal management of SYS: Herbert Sullivan, President, and Stuart B. Smithberg, Executive Vice-President.

Accomplishments



Although SYS is young in years, its capabilities can be measured by its accomplishments and by its contributions to the major projects listed below.

Computer Architecture

- MSI I/O Processor
- LSI Airborne Computer
- Third-Generation Navigational Computer
- Third-Generation Real-Time Process Control Computer
- Third-Generation Real-Time Polling/Responder Computer
- Third-Generation Real-Time Communications Concentrator
- Optimum Configuration of On-Line Video Display Processor

Data Communications

- Real-Time Time-Shared Executive for Store-and-Forward Message Switch
- Real-Time Store-and-Forward Message Switch for Securities Industry
- Remote Data Concentrator for Largest Time-Sharing Network
- Real-Time Multiprogramming Operating System for ASW Trainer

Graphic Arts & Computer-Aided Design

- All Solid State Photocomposing Keyboard
- LSI Mask Generation Using General Purpose Computer and Graphics CRT Display

Computerized Testing & Checkout

- Use of General Purpose Computer to Test Special Navigational Computer
- Interpretive Assembler and Test Programs for Real-Time Data Processing System

Data Acquisition

- Intensive Care Patient-Monitoring Systems for Hospitals
- Automatic Data Collection from Remote Meteorological Stations
- Automatic Data Collection from Remote TV Commercial Monitoring Stations
- Automatic Data Collection from Remote Human and Automatic Data Entry Stations

Business Systems Design & Implementation

- Integrated Accounts Receivable, Credit Management, & Sales History System for IBM System/360
- Business Information System for Univac 9200/9300 Computer
- General Purpose File Management System for IBM 1130 Computer, Including Accounts Receivable, Inventory Control, Payroll, & Report Generating Programs, all compatible with IBM 1800
- Tape-to-Tape Conversion System for conversion of any magtape to any other magtape format, cash register paper tape to magtape, and dataphone to magtape, with computer analysis, verification, and printout

CATV System

- Hardware/software systems for providing CATV subscribers with TV channel selection, fire and burglar detection, stock quotations, credit checking, shop-at-home, hotel reservations, etc.

PRELIMINARY

SYS

Editerm 200

A keyboard entry and display terminal designed primarily as a compatible substitute for the IBM 2265 Model 2 and 2845 controller, with additional features.

The Editerm 200 can communicate with System 360 Models 25 through 85 or 195 via the IBM 2701 Data Adaptor. For diagnostic support, models 25 and 30 must have 16K (min.) of core; models 40 and higher require 32K (min.) of core.

Highly flexible methods are provided for deleting, adding, or modifying data by character or line, and for setting up tab points and protected fields (see Features 02 & 03 overleaf).

The basic interface is to standard modems at rates up to 9600 bauds. Parallel data transfer rates up to 2,000,000 char/sec are also available. In addition, the Editerm 200 can be interfaced to a variety of input and output devices, including cassettes, typewriters, line printers, 7- and 9-channel magnetic tape units, card readers, and paper tape units.

FORMAT

Screen Size	9" x 7" (11" Diagonal)
Characters/Line	80
Lines	12
Character Format	5 x 7 dot matrix
Character Set	USASCII 96 char
Char. Displayed	72 (96 optional)
Refresh Rate	60 per second
Keyboard	Selectric typewriter layout
Cursor	Nondestructive



CONTROL KEYS

Cursor	Up, Down, Left, Right, Home
Erase	Screen, Character, Line, Message
Add	Character, Line
Normal	All characters erasable
Save Form	Allows protected fields

INTERFACE

Serial	EIA RS-232B up to 9600 bps
Parallel	Asynchronous up to 3000 char/sec
	Synchronous up to 2,000,000 char/sec

OPERATING MODES

On Line/Off/Local
Full Duplex
Half Duplex
Page Mode
Roll Mode

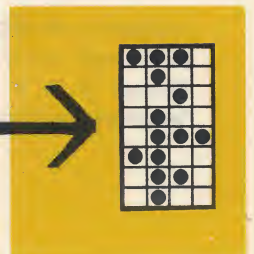
OPTIONS AVAILABLE (for details, see overleaf)

01	Lower Case Display
04	Switch-Selectable Modem Speeds
05	Remote Cursor Controls
06	Hard Copy Drivers
07	Overlapped Memory
08	Numeric Keyboard
09	Remote Monitor Station
10	Cassette Storage
11	7- or 9-channel tape interface
12	Expanded Transmission

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Standard Features

02

EXPANDED EDITING. The expanded editing facility provides separate control keys for adding or deleting a character and for adding or deleting a line. The push/pull keys allow line lengths to be equalized after changing the text.

03

FORMAT/TAB. In the Format mode, any data lying between a pair of tab points (displayed as carets) is protected. Protected fields are neither transmitted to line nor erased by the Clear Screen command; however, unprotected fields are both transmittable and erasable. Any number of tab points may be set up; each consists of a pair of adjacent tab codes that effectively create a protected field of zero width. Detection of a tab command causes the cursor to skip to the start of the next unprotected field.

Optional Features

01

LOWER CASE DISPLAY. In the standard model, lower case codes are stored in the buffer but are converted to upper case for display. With option 01, lower case characters are displayed in lower case on the screen.

04

SWITCH-SELECTABLE MODEM SPEEDS. In the standard model the modem speed must be specified at the time of order. Option 04 allows the six standard modem speeds of 10, 15, 30, 60, 120, and 240 char/sec to be available on switch contacts; the speed is selected at installation to suit the modem facilities available.

05

REMOTE CURSOR CONTROLS. This option permits the remote computer to position the cursor anywhere on the screen by giving the Home command or the appropriate number of Left, Right, Up, or Down commands.

06

HARD COPY DRIVERS. The Editerm 100 contains a teletype driver as a standard feature. Option 06 provides solenoid drivers that allow the Editerm 200 to drive a Selectric or other electric typewriter.

07

OVERLAPPED MEMORY. Option 07 allows verified data on the screen to be transferred from the main memory to an output buffer memory of the same capacity, from which the data is sent to line while the operator is entering new data on the screen.

08

NUMERIC KEYBOARD. This option allows numeric data to be entered via a separate keyboard having the numerals 0 through 9 in a layout similar to that of the touch-tone telephone keyboard.

09

REMOTE MONITOR STATION. This station contains a TV raster display that is driven by the terminal logic but may be located up to 200 feet from the terminal.

10A

SINGLE CASSETTE TAPE STORAGE. The cassette unit is supplied complete with read/write electronics. Data may be recorded from the keyboard during entry, from the memory during transmission, or from line during Reception. Tape capacity is 3,250,000 bits per side. The cassette may be manually turned to obtain total storage of 6,500,000 bits.

10B

DUAL CASSETTE TAPE STORAGE. A dual cassette unit with one set of read electronics and one set of write electronics. Data stored on one cassette may be displayed, edited, and rerecorded on the other cassette. The read/write and tape movement functions of both may be controlled locally or (if option 05 is purchased) from the remote computer.

11A

IBM 9-CHANNEL INTERFACE. A 9-channel tape drive and interface module that allows the terminal to read and write IBM-compatible 9-channel magnetic tapes.

11B

7-CHANNEL INTERFACE. A 7-channel tape drive and interface module that allows the terminal to read and write 7-channel IBM or Industry Standard magnetic tapes.

12

EXPANDED TRANSMISSION. This option allows an unattended terminal to automatically answer calls from the computer. The computer then controls the subsequent action by means of three commands: Read and Send, which causes the terminal to read a message (up to 1024 characters in length) from magnetic tape and send it to the computer; Retransmit, which causes the last block read into the buffer to be sent to line again (used when the computer detects transmission errors); and Record, which causes the terminal to read a block from the computer and record it on tape.

PRELIMINARY SYS Editerm

Character Font

- The Editerm 100 is equipped with a TTY keyboard capable of generating the USASCII characters shown in columns 0 through 5 of the table below. An expanded USASCII keyboard, capable of generating all 128 of the characters in columns 0 through 7, is available as an option.
- For any given character, the code stored in memory is found as follows:
 - Find the character in the table (example:R).
 - Look up to the head of the column to find bits 7, 6, 5 (ex.: 1 0 1).
 - Look to the left of the row to find bits 4, 3, 2, 1 (ex.: 0010).
 - Write down the complete code with bit 7 at the left and bit 1 at the right (example: R = 1 0 1 0 0 1 0).
 - Bit 7 is the most significant bit; bit 1 is the least significant bit and (in serial) is sent to line first. If a parity bit is generated, it is placed in the 8th (most significant) bit position and is sent to line last.
- When the expanded USASCII keyboard is used, the lower case codes for characters in columns 6 and 7 are stored in memory, but are displayed on the screen as as the corresponding upper case characters unless the Lower Case Display option (01) has been purchased.
- The control characters in columns 0 and 1 are generated by holding down the CTRL (control) key and then pressing the character key. Control character codes are stored in memory but are all displayed as carets (^). The VT code is used to set the Format mode, and the FF code is used to clear the screen.



THIS IS A PHOTOGRAPH OF THE EDITERM
TYPE FACE, SHOT FULL SIZE DIRECTLY
FROM THE SCREEN OF THE EDITERM 100.

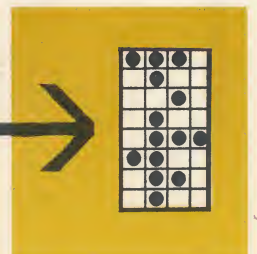
							Control			Upper Case			Lower Case		
b7 b6 b5 b4 b3 b2 b1 Bits	Column Row						0	0	0	0	0	0	0	0	0
	0	1	2	3	4	5	6	7							
0	0	0	0	0	NUL	DLE	SP	0	@	P	\	p			
0	0	0	1	1	SOH	DC1	!	1	A	Q	q	q			
0	0	1	0	2	STX	DC2	"	2	B	R	b	r			
0	0	1	1	3	ETX	DC3	#	3	C	S	c	s			
0	1	0	0	4	EOT	DC4	\$	4	D	T	d	t			
0	1	0	1	5	ENQ	NAK	%	5	E	U	e	u			
0	1	1	0	6	ACK	SYN	&	6	F	V	f	v			
0	1	1	1	7	BEL	ETB	'	7	G	W	g	w			
1	0	0	0	8	BS	CAN	(	8	H	X	h	x			
1	0	0	1	9	HT	EM	)	9	I	Y	i	y			
1	0	1	0	10	LF	SUB	+	:	J	Z	j	z			
1	0	1	1	11	VT	ESC	=	;	K	[	k	;			
1	1	0	0	12	FF	FS	,	<	L	\	l	l			
1	1	0	1	13	CR	GS	-	=	M	]	m	}			
1	1	1	0	14	SO	RS	.	>	N	^	n	~			
1	1	1	1	15	SI	US	/	?	O	_	o	DEL			

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ASCII CHARACTER ADDRESS INPUTS	WORD SELECT INPUTS	OUTPUTS			
A9 A8 A7 A6 A5 A4	A3 A2 A1	05 04 03 02 01	05 04 03 02 01	05 04 03 02 01	05 04 03 02 01
$\overline{X} \ X$		00	01	10	11
0 0 0 X X 0	0 0 0	0 0 0 0 0 0	0 0 0 0 0 0	0 0 0 0 0 0	0 0 0 0 0 0
	0 0 1				
	0 1 0				
	0 1 1				
	1 0 0				
0 0 0 X X 1	1 0 1				
	1 1 0				
	1 1 1				
	0 0 0	0 0 0 0 0 0	0 0 0 0 0 0	0 0 0 0 0 0	0 0 0 0 0 0
	0 0 1				
0 0 1 X X 0	0 1 0				
	0 1 1				
	1 0 0				
	1 0 1				
	1 1 0				
0 0 1 X X 1	1 1 1				
	0 0 0	0 0 0 0 0 0	0 0 0 0 0 0	0 0 0 0 0 0	0 0 0 0 0 0
	0 0 1				
	0 1 0				
	0 1 1				
0 1 0 X X 0	1 0 0				
	1 0 1				
	1 1 0				
	1 1 1				
	0 0 0	0 0 0 0 0 0	0 0 0 0 0 0	0 0 0 0 0 0	0 0 0 0 0 0
0 1 0 X X 1	0 0 1				
	0 1 0				
	0 1 1				
	1 0 0				
	1 0 1				
0 1 1 X X 0	1 1 0				
	1 1 1				
	0 0 0	0 0 0 0 0 0	0 0 0 0 0 0	0 0 0 0 0 0	0 0 0 0 0 0
	0 0 1				
	0 1 0				
0 1 1 X X 1	0 1 1				
	1 0 0				
	1 0 1				
	1 1 0				
	1 1 1				

ASCII CHARACTER ADDRESS INPUTS	WORD SELECT INPUTS	OUTPUTS			
A9 A8 A7 A6 A5 A4	A3 A2 A1	05 04 03 02 01	05 04 03 02 01	05 04 03 02 01	05 04 03 02 01
$\overline{X} \ X$		00	01	10	11
1 0 0 X X 0	0 0 0	0 0 0 0 0 0	0 0 0 0 0 0	0 0 0 0 0 0	0 0 0 0 0 0
	0 0 1				
	0 1 0				
	0 1 1				
	1 0 0				
1 0 0 X X 1	1 0 1				
	1 1 0				
	1 1 1				
	0 0 0	0 0 0 0 0 0	0 0 0 0 0 0	0 0 0 0 0 0	0 0 0 0 0 0
	0 0 1				
1 0 1 X X 0	0 1 0				
	0 1 1				
	1 0 0				
	1 0 1				
	1 1 0				
1 0 1 X X 1	1 1 1				
	0 0 0	0 0 0 0 0 0	0 0 0 0 0 0	0 0 0 0 0 0	0 0 0 0 0 0
	0 0 1				
	0 1 0				
	0 1 1				
1 1 0 X X 0	1 0 0				
	1 0 1				
	1 1 0				
	1 1 1				
	0 0 0	0 0 0 0 0 0	0 0 0 0 0 0	0 0 0 0 0 0	0 0 0 0 0 0
1 1 0 X X 1	0 0 1				
	0 1 0				
	0 1 1				
	1 0 0				
	1 0 1				
1 1 1 X X 0	1 1 0				
	1 1 1				
	0 0 0	0 0 0 0 0 0	0 0 0 0 0 0	0 0 0 0 0 0	0 0 0 0 0 0
	0 0 1				
	0 1 0				
1 1 1 X X 1	0 1 1				
	1 0 0				
	1 0 1				
	1 1 0				
	1 1 1				

EDITERM 100, Bit Pattern for Displayed Characters

SYS 200BDT **PRELIMINARY**

Batch Data Terminal

The SYS 200BDT is one product in a family of terminals that utilize our unique, extremely economical and flexible, modular terminal processor. It is this processor which allows the SYS 200BDT to be a sophisticated send/receive station that provides on-line and off-line data preparation facilities with

- The simplicity of a standard office typewriter
plus
- Full editing and format control
plus
- Full upper and lower case display
plus
- Data storage for 6.5 million bits
plus
- On-line computer inquiry/response
plus
- Unattended data transmission and reception
plus
- Reduction of transmission time and cost

In a typical application, the SYS 200BDT is used as a remote terminal in a network linking dealers to their company's central computing facility. During the day, the operator types and records the variable information required to complete sales records, inventory control, and similar forms. The formatting facility allows the form headings to be prerecorded on a cassette and typed out automatically, thus saving the operator's time. Only the format identity number and the associated variable data are recorded for transmission; the form headings, which are always in the same order for a given format, are omitted. This omission of redundant information reduces transmission time and cost.

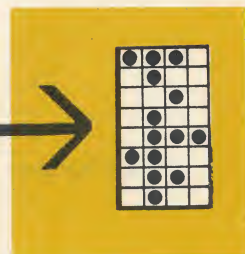
After business hours, the central computer dials up each terminal in turn under program control. When communication with a terminal is established, the computer first collects all the data recorded during the day, ordering retransmission of any blocks in which transmission errors were detected; then it sends back any messages destined for that terminal, and these messages are recorded on the cassette. The entire process is carried out under control of the central computer, and requires no operator intervention at the terminal. On the following morning, the operator finds a message indicator lamp lit, and plays back the messages. These may be typed out directly, or the operator may first view them on the screen to see what needs hard copy.

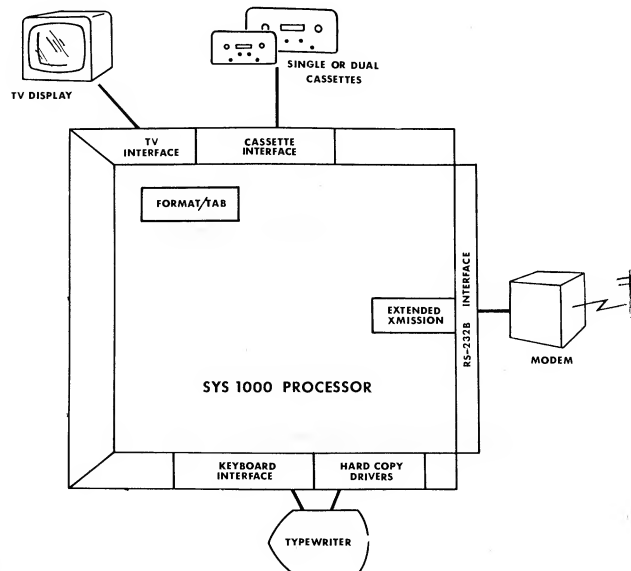
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- **I/O ELECTRIC TYPEWRITER**

The typewriter keyboard is just like that of an office typewriter. Characters typed on the keyboard appear on a TV display; hard copy may be produced simultaneously, or may be delayed until the data on the screen has been corrected or edited.

- **TV DISPLAY**

When used independently, the TV display gives the operator a preview of what she has typed, and allows her to make corrections before the data is typed or edited. However, the TV display can be used concurrently with the I/O electric typewriter.

- **CASSETTE STORAGE**

Data entered via the keyboard may be recorded on standard "Norelco" cassettes with a capacity of 6,500,000 bits per cassette. Dual cassettes are standard.

- **PROCESSOR**

The modular microprocessor contains all the logic required to provide:

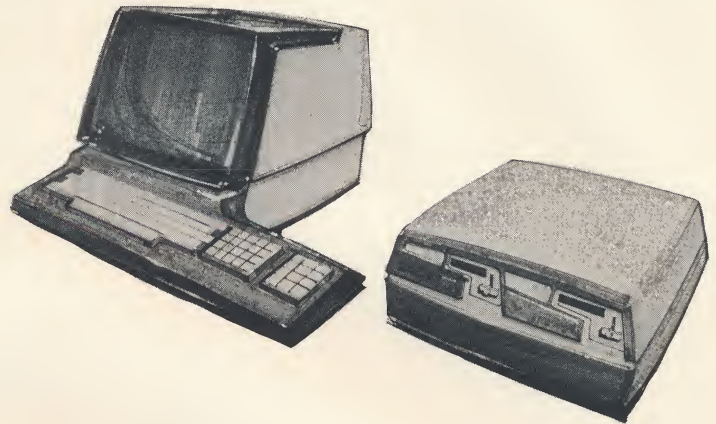
- Format Protection
- Full Editing Capability
- Full Correction Capability
- I/O Controllers
- Modem Controllers
- Bidirectional Batch Transmission
- Bidirectional Inquiry Mode
- Error Control
- Unattended Send/Receive
- Automatic Retransmission

PRELIMINARY

SYS 300KT Key-Tape & 300KC Key-Cassette Units

The SYS 300KT and 300KC are basically similar units that are designed to replace a keypunch. Both units accept input from a keyboard with a layout like that of the IBM 029 Keypunch and write data to 7-channel Industry Standard or 9-channel IBM-compatible magnetic tape (300KT) or to cassette magnetic tape (300KC). The difference between the two units is mainly that the 300KT has a 7-channel or 9-channel interface to drive an external tape unit, whereas the 300KC is supplied complete with cassette interface and single or dual cassette unit.

For applications where either unit is to be used at a location remote from the computing facility, an RS-232B-compatible modem interface or acoustic coupler interface is available as an optional extra.



HARDWARE

The SYS 300KT Key/Tape and 300KC Key/Cassette units consist of the following major components in the standard SYS EDITERM housing:

300KT
Keyboard (029 layout)
TV Display (2 lines, 80 char. per line)
SYS 1000 Processor with Format/Tab
7-ch or 9-ch magtape interface

Optional hard copy drivers

300KC
Keyboard (029 layout)
TV Display (2 lines, 80 char. per line)
SYS 1000 Processor with Format/Tab
Cassette interface
Single or dual cassette unit with control
and read/write electronics
Optional hard copy drivers

OPERATION

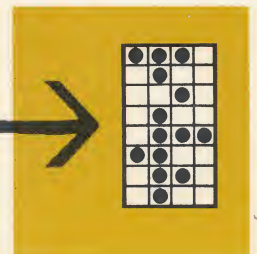
Card formats are numbered and are prerecorded on cassette or tape using the Create mode. To use a format, the operator specifies the format number by means of a set of three digital thumbwheel switches and then puts the unit in the Search mode. The unit searches the format tape for the desired format and enters the format headings on the display in protected fields. The operator now enters the variable data in unprotected fields. The format fields and data fields together occupy two lines on the display. After entering the data, the operator verifies it visually and makes any necessary corrections by positioning the cursor under incorrect characters and then striking the correct key to overwrite the erroneous data. After verification, the operator presses the Write key; the corrected data is then written to magtape and, if a hard copy printer is included in the system, is simultaneously printed out.

Document No. 1-041-MD6007-A

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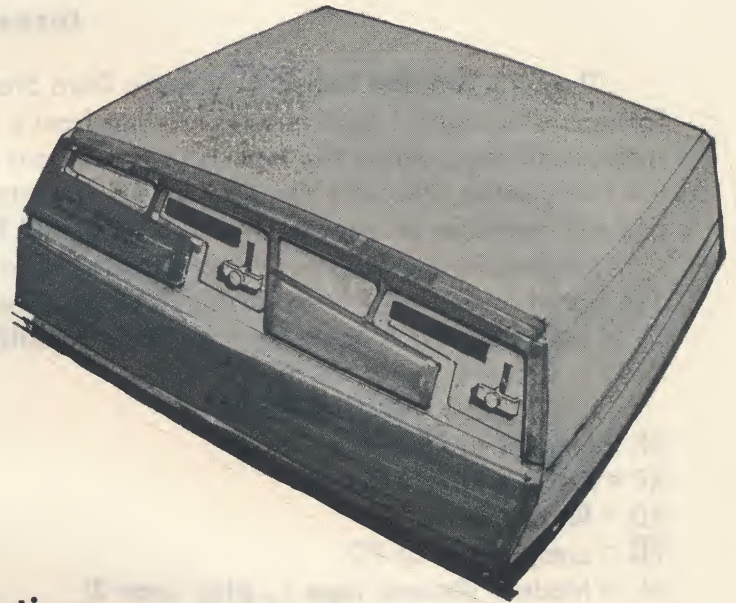


PRELIMINARY

SYS 10 Cassette Data Storage Units

Features

- 6.5 Mbit storage capacity
- 1800 bits/sec serial data rate
- 30 minutes per side recording time
- Accepts standard Phillips cassettes
- TTL Logic-compatible (0V, +5V)
- RS-232B-compatible
- "Write Ring" built in
- BOT and EOT detection
- Economical and expandable
- Reliable and simple



Description

The SYS 1000-10A is a single-cassette magnetic tape data storage unit complete with read/write and control electronics. The unit is self-contained and can be supplied with or without a power supply and with or without a modem.

By adding a second tape handler, the

unit can be converted to the SYS 1000-10B dual-cassette storage unit. The extra cost is minimal, since both tape handlers share the same set of electronics

The SYS 1000-10 units are ideally suited for collecting data from minicomputers, transmission lines, or terminal devices.

Applications

- File Storage
- Program Loading into Minicomputers
- Program Dumping from Minicomputers
- Program Assembly
- Tape Sorting/Merging/Duplicating
- Replacement for Paper Tape Reader/Punch

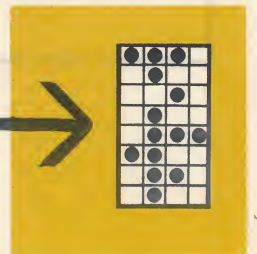
- Key-Cassette Systems
- Remote Batch Data Terminals
- Cash Register Terminals
- Point-of-Entry Terminals
- Magnetic Tape Terminals
- Text Editing

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Options

202D Modem built in
103 Modem built in
Read-after-Write error checking
Tape Search Mode for locating individual records

Interfacing

The SYS 10A and SYS 10B Cassette Data Storage Units can be operated under manual control for recording digital data in serial format from a data line. However, this mode does not provide interrecord gaps, since the tape is in continuous motion. When tape motion and cassette selection are to be under computer control, a device controller must be interposed between the cassette unit and the computer or modem; the SYS 1000 I/O Processor is ideal for this purpose.

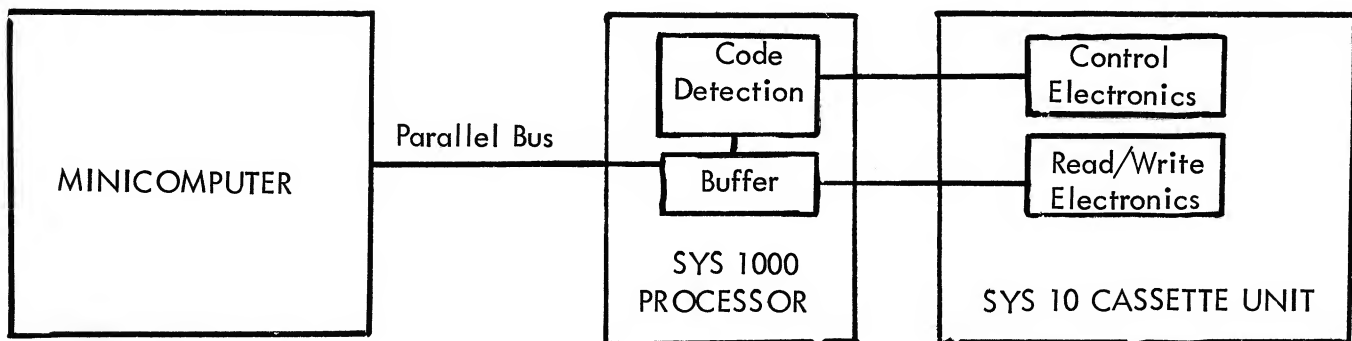
For interfacing purposes, the following data and control lines are available to the user, all at TTL signal levels (+5V = logic "1" = EIA positive = Spacing condition = Control line ON; 0V = logic "0" = EIA negative = Marking condition = Control line OFF).

INPUT SIGNALS

RR = Request to Record
RP = Request for Playback
RD = Record Data
 $\overline{RD}$ = complement of RD
M = Mode 1 (Record Tape 1, play Tape 2)
(When M is OFF, Mode 2 is set)
RW1 = Rewind Tape 1
RW2 = Rewind Tape 2
FF1 = Fast Forward Tape 1
FF2 = Fast Forward Tape 2
GND = Signal ground

OUTPUT SIGNALS

TRR1 = Tape 1 Ready to Record
TRR2 = Tape 2 Ready to Record
CTS = Clear to Send Data
EOT1 = End of Tape 1
EOT2 = End of Tape 2
BOT1 = Beginning of Tape 1
BOT2 = Beginning of Tape 2
PD = Played Back Data
 $\overline{PD}$ = complement of PD
DCD = Data Carrier Detect
 $\overline{DCD}$ = complement of DCD
TRP1 = Tape 1 Ready to Play
TRP2 = Tape 2 Ready to Play



PRELIMINARY

SYS 200TE Text Editing System

Hardware

- Editerm 200 terminal, equipped with TV raster display, Format/Tab Control, and Expanded Editing as standard features
- Options 01 (Lower Case Display), 06 (Hard Copy Drivers), 07 (Overlapped Memory), and 10B (Dual Cassettes)
- Selectric I/O typewriter

Applications

Books and Manuals
Frequently Revised Documents
Letters with variable addresses or Data
Justifiable Input to Phototypesetters

System Operation

Draft text is composed on the Editerm screen, and after correction of obvious errors is simultaneously recorded on cassette and typed out on the Selectric typewriter. The hard copy is sent to the originator for review.

When the marked-up draft is returned for correction, the operator inserts the draft cassette in one slot and a blank cassette in the other. Each time she presses the Read key, a block of draft text is displayed in the top half of the screen. She can replace a wrong letter by the correct one, or create a space in which to insert an omitted character, or delete a superfluous character (in which case the gap left by the deletion is automatically closed up). Likewise she can delete an entire line or create a space in which to insert a new line.

The Overlapped Memory and the unique Push/Pull facilities allow great flexibility in compensating for large additions or deletions. Words pushed off the end of the line by an addition are automatically inserted in the line below, and this process is continued in all lines displayed on the screen. Likewise, gaps created by deletions can be filled by pulling words up from the lines below. Thus, line lengths can be approximately equalized throughout a paragraph.

Editing is made much easier by the fact that the operator can display a complete page (12 or 24 lines) at one time, though she works only in the top half. When the top half is corrected and acceptable, she rerecords it on the blank cassette and can simultaneously obtain hard copy on the typewriter.

Document No.: 1-041-MD6010-A

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PRELIMINARY

SYS 1000P POOLER

The SYS 1000P Tape Pooler is an extremely economical and flexible translator unit that converts any 6-, 7-, or 8-bit code into any other 6, 7-, or 8-bit code. The overlapped, solid-state memory allows blocks up to 1024 characters in length to be assembled in an input buffer and transferred to an output buffer for code translation and transmission to the output device.

APPLICATIONS

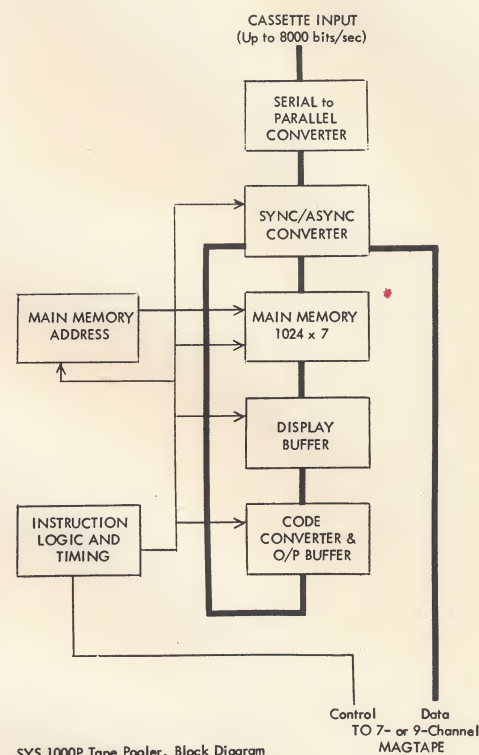
Translation of Correspondence or Selectric codes to USASCII or vice versa; translation of USASCII or Selectric to EBCDIC or vice versa. At slight extra cost the SYS 1000P can be made reversible for any two of the above codes. In a typical application, the SYS 1000P accepts serial characters in Correspondence code at any rate up to 300 characters/sec, translates these into EBCDIC, and writes them to 7- or 9-channel IBM-compatible tape for processing by a System/360 computing facility.

OPERATION

The main components of the SYS 1000P are shown in the block diagram. The Serial/Parallel converter accepts serial characters at rates up to 9600 bauds (synchronous or asynchronous) and converts them to parallel format. The synchronizer accepts the parallel characters, strips off the start, stop, and parity bits, and transfers the data to sequential locations of the main memory. The transfers are synchronized to the 2-MHz master clock. Blocks of up to 100 characters are transferred to the display memory, where they are used successively to address the Read Only memory used as the code converter. Double buffering of the ROM ensures that the desynchronizer will be able to supply characters asynchronously to the output device at rates up to 3000 characters per second. With only slight modifications, transfer rates of up to 2,000,000 characters/second can be obtained.

The interface buffer stores a complete block (up to 100 characters long) and writes it to the magtape unit while a further block is being read from cassette. Cassette records contain 100 characters bounded by special start-of-block and end-of-block characters. When the record data is less than 100 characters it is filled out with EBCDIC delete characters.

The cassette supplies a clock signal to indicate when each bit may be sampled. The buffer supplies a 20-KHz clock signal that permits data to be strobed into the magtape unit. The instruction logic of the Pooler supplies or recognizes a cassette start/stop signal, a magtape Start/Stop signal, and various equipment status signals.



SYS computer corp.*

Document No. 1-041-MD6006-A

17-25 DI CAROLIS COURT, HACKENSACK, N.J. 07601 / (201) 488-0300

*Proposed new name of SYS associates, inc.



PRELIMINARY

SYS

Editerm 100

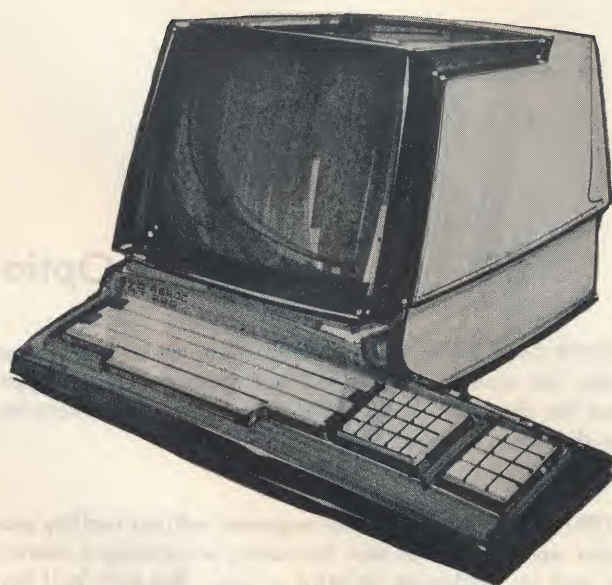
A keyboard entry and display terminal designed primarily as a compatible substitute for ASR 33 and 35 teletypes. The Editerm 100 is faster and quieter than the teletype, and can perform editing before transmission of the data or through computer software.

The basic interface is to standard modems at rates up to 9600 bauds. Parallel data transfer rates up to 2,000,000 char/sec are also available.

Among the features of this system are an end-of-line indicator, a last-line indicator, and roll mode operation. Roll mode allows an information block of more than page size to be viewed consecutively; once the frame is full, new information is entered in the bottom line and previous lines are pushed up one place; the top line is pushed offscreen.

The Editerm 100 can be interfaced to a variety of input and output devices, including cassettes, teletypes, line printers, 7- and 9-channel magnetic tape units, card readers, and paper tape equipment.

MODEL	A	B	C	D	E
Format					
Screen Size (Diagonal)	11"	11"	11"	11"	11"
Characters/Line	32	40	40	80	80
Lines	8	12	24	12	24
Character Format	5 x 7 dot matrix				
Character set	USASCII 64 char (96 optional)				
Refresh Rate	60 per second				
Keyboard	Standard teletype layout				
Cursor	Nondestructive				



CONTROL KEYS:

Cursor	Up, Down, Left, Right, Home
Erase	Screen, Character, Line, Message
Repeat	
Transmit	

INTERFACE

Serial	EIA RS-232B, up to 9600 bauds
Parallel	Asynchronous up to 3000 char/sec
	Synchronous up to 2,000,000 char/sec

OPERATING MODES

On Line/Off/Local	
Full Duplex	Keyboard to line and display
	Display from line or keyboard
Half Duplex	
Page Mode	
Roll Mode	

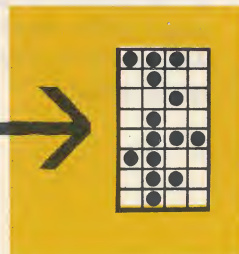
OPTIONS AVAILABLE (for details, see overleaf)

02	Expanded Editing
03	Format/Tab
04	Switch-selectable Modem Speeds
05	Remote Cursor Controls
07	Overlapped Memory
08	Numeric Keyboard
09	Remote Monitor Station
10	Cassette Storage
11	7- or 9-channel tape interface
12	Expanded Transmission

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Optional Features

01

LOWER CASE DISPLAY. In the standard model, lower case codes are stored in the buffer but are converted to upper case for display. With option 01, lower case characters are displayed in lower case on the screen.

02

EXPANDED EDITING. The expanded editing facility provides separate control keys for adding or deleting a character and for adding or deleting a line. The push/pull keys allow line lengths to be equalized after changing the text.

03

FORMAT/TAB. In the Format mode, any data lying between a pair of tab points (displayed as carets) is protected. Protected fields are neither transmitted to line nor erased by the Clear Screen command; however, unprotected fields are both transmittable and erasable. Any number of tab points may be set up; each consists of a pair of adjacent tab codes that effectively create a protected field of zero width. Detection of a tab command causes the cursor to skip to the start of the next unprotected field.

04

SWITCH-SELECTABLE MODEM SPEEDS. In the standard model the modem speed must be specified at the time of order. Option 04 allows the six standard modem speeds of 10, 15, 30, 60, 120, and 240 char/sec to be available on switch contacts; the speed is selected at installation to suit the modem facilities available.

05

REMOTE CURSOR CONTROLS. This option permits the remote computer to position the cursor anywhere on the screen by giving the Home command or the appropriate number of Left, Right, Up, or Down commands.

06

HARD COPY DRIVERS. The Editerm 100 contains a teletype driver as a standard feature. Option 06 provides solenoid drivers that allow the Editerm 200 to drive a Selectric or other electric typewriter.

07

OVERLAPPED MEMORY. Option 07 allows verified data on the screen to be transferred from the main memory to an output buffer memory of the same capacity, from which the data is sent to line while the operator is entering new data on the screen.

08

NUMERIC KEYBOARD. This option allows numeric data to be entered via a separate keyboard having the numerals 0 through 9 in a layout similar to that of the touch-tone telephone keyboard.

09

REMOTE MONITOR STATION. This station contains a TV raster display that is driven by the terminal logic but may be located up to 200 feet from the terminal.

10A

SINGLE CASSETTE TAPE STORAGE. The cassette unit is supplied complete with read/write electronics. Data may be recorded from the keyboard during entry, from the memory during transmission, or from line during Reception. Tape capacity is 3,250,000 bits per side. The cassette may be manually turned to obtain total storage of 6,500,000 bits.

10B

DUAL CASSETTE TAPE STORAGE. A dual cassette unit with one set of read electronics and one set of write electronics. Data stored on one cassette may be displayed, edited, and rerecorded on the other cassette. The read/write and tape movement functions of both may be controlled locally or (if option 05 is purchased) from the remote computer.

11A

IBM 9-CHANNEL INTERFACE. A 9-channel tape drive and interface module that allows the terminal to read and write IBM-compatible 9-channel magnetic tapes.

11B

7-CHANNEL INTERFACE. A 7-channel tape drive and interface module that allows the terminal to read and write 7-channel IBM or Industry Standard magnetic tapes.

12

EXPANDED TRANSMISSION. This option allows an unattended terminal to automatically answer calls from the computer. The computer then controls the subsequent action by means of three commands: Read and Send, which causes the terminal to read a message (up to 1024 characters in length) from magnetic tape and send it to the computer; Retransmit, which causes the last block read into the buffer to be sent to line again (used when the computer detects transmission errors); and Record, which causes the terminal to read a block from the computer and record it on tape.

Products



The IBM 1130 as a Real-Time, On-Line Processor

The SYS 2113 Extender system, with its comprehensive line of interfaces, permits the IBM 1130 to be used for on-line, real-time collection of both digital and analog data, and for the generation of digital and analog control signals. The 1130, with the SYS hardware and software (including the powerful Real-Time Scheduling Monitor), thus becomes a low-cost version of the IBM 1800. The user writes his applications programs in FORTRAN or in 1130 Assembler Language as supplied by IBM. Dataset interfaces, polling units, and CRT terminals available from SYS permit the full potentialities of the 1130 to be realized in any situation. These hardware/software packages are available immediately in ready-to-use form.

Additional Free-Standing Products for the 1130:

- Communications Adapters (Sync & Async)
- Interactive Graphics CRT Display (FASTPLOT)
- Data Communications Preprocessor-Concentrator
- General Purpose Interface for "Foreign Devices"
- File Management Software Packages



System 3360

This bidirectional tape-to-tape converter is of a general purpose nature. Though originally designed to convert Univac IIIA magtapes to IBM 360 magtapes and vice versa, the modular construction of both the hardware and the software allows conversion of any magtape format to any other magtape format. Paper tape output from NCR cash registers can also be converted to magtape. The conversion software both checks the data read and changes the format as required, so that only validated data is written to magtape. The addition of a high-speed line printer transforms the system into a tape-to-print station.

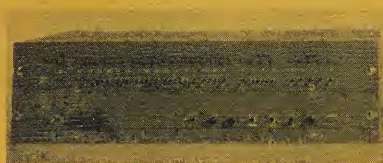
SYS 1000 I/O Processor

The SYS 1000 Processor is an economical, highly modular I/O data handler capable of accepting serial or parallel data, synchronously or asynchronously, at rates up to 2,000,000 characters per second. The processor has an expandable, modular memory and firmware for code conversion. The processor is ideally suited for:

- CRT/Key-Tape devices/Poolers
- Text Editing/Data Terminals
- Concentrators/Batch Data Terminals
- Numerical Control

Currently available accessories for the SYS 1000 Processor:

- TV Alphanumeric Display
- Cassette Storage
- Typewriters
- Teletypes
- Modems
- IBM Magnetic Tapes
- Line Printers
- Card Readers



Computer Experience



The members of the SYS consulting staff average more than ten years experience in the computer field, with hands-on knowledge of almost all existing computers, programming languages, and operating systems. Some samples are included below:

COMPUTER EXPERIENCE

IBM:

360/20/30/40/50/65/67, 1130, 1800, 7090/94, 7040/44, 1401, 1440, 1460, 1410/7010, 1620, 704, 650, 705

RCA:

SPECTRA 70/35/45, 3301

UNIVAC:

1107, 1108, 418, 9200, 9300, U111, SS80, SS90, 494, 1004

HONEYWELL:

200, 8200, DDP 124, 224, 416, 516

CONTROL DATA:

6400, 6600, 3100, 3200, 8090, 160A, G-15, G-20

GENERAL ELECTRIC:

235, 625

SDS:

920, Sigma 2, Sigma 7

BURROUGHS:

D 830, 3500, 5500

OTHERS:

ADX 7300
RPC 4000
LGP 30
AN/FSQ-32V
LSI 8800
NCR 315
PDP 8
VARIAN 620/i

PROGRAMMING LANGUAGES

ALGOL	JOVIAL
FORTRAN	ART
COBOL	SPS
PL 1	COMTRAN
SAP/FAP/MAP	SPURT
BAL/ALC	GPSS
BASIC	SYMBOL
AUTOCODER	SNOBOL
EASYCODER	SLEUTH
NELIAC	

Clients



American Bosch Arma Corp.
Anathon Computer & Educational Systems, Inc.
A.R.A.P., Inc.
Automatic Data Processing, Inc.
C.&O., B.&O. Railroad
Blass Antenna Electronics Corp.
Canada Department of National Defense
Columbia Presbyterian Medical Center
Compat Corporation
Computer Modem Corporation
Controls & Instruments GmbH
Curtiss-Wright Corporation
Datum, Inc.
Datum, Inc.
Elmhurst General Hospital
Filigree Foods, Inc.
Finkel Outdoor Products, Inc.
Friden, Inc.
General Electric Co., Information Services
General Precision, Inc. Aerospace Group
ITT, Avionics Division
International Digisonics Corporation

Joanell Laboratories, Inc.
Kollsman Instrument Corporation
Lear Siegler, Inc.
Lockheed Electronics Company
John P. Maguire & Co., Inc.
McCrary Corporation
Mobil Oil Corporation
Motorola, Inc.
Mount Sinai Hospital, N.Y.
Nuclear Research Associates
PCS Data Processing, Inc.
Chas. Pfizer & Co., Inc.
Raytheon Company
The Singer Company
Stromberg Carlson Corporation
Subscription Television, Inc.
TRG-a Division of Control Data Corporation
TRG-a Division of Control Data Corporation
The Western Union Telegraph Co.
John Wiley & Sons, Inc.
XLO Computer Systems Group

Facilities



SYS currently occupies a modern, 18,000-square foot, fully air-conditioned facility consisting of offices, conference rooms, laboratories, and manufacturing assembly areas.

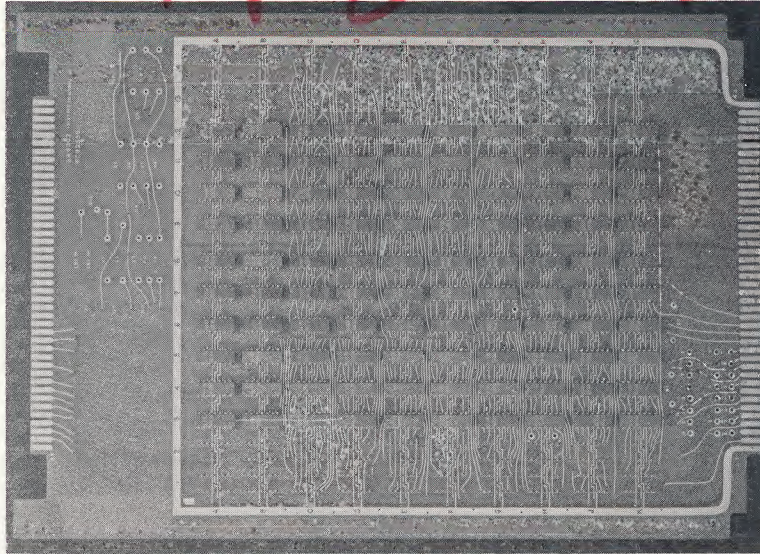
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\$1500
Editing capability, code conversions

SYS 1000 I/O Processor

Not programmable. Firmware on rope core. 500 ns.



For years, the relatively simple data flow, timing, and code conversion requirements of peripheral and OEM devices communicating with each other have been met by using a specially designed logic package or even a minicomputer as the controller.

Now SYS offers the SYS 1000, an extremely low-cost, simple, and versatile microprocessor designed to satisfy all I/O and data terminal requirements. The SYS 1000 is not only cheaper than a minicomputer but eliminates the need for time-consuming interfacing and software writing. With any of the numerous built-in or available interfaces, the unit is ready-to-use!

The SYS 1000 can handle widely varying formats, including:

- Serial or Parallel Characters
- Synchronous or Asynchronous Characters
- Any Two Codes
- Word Lengths Up To 16 Bits
- Block Lengths Up To 1024 8-Bit Characters

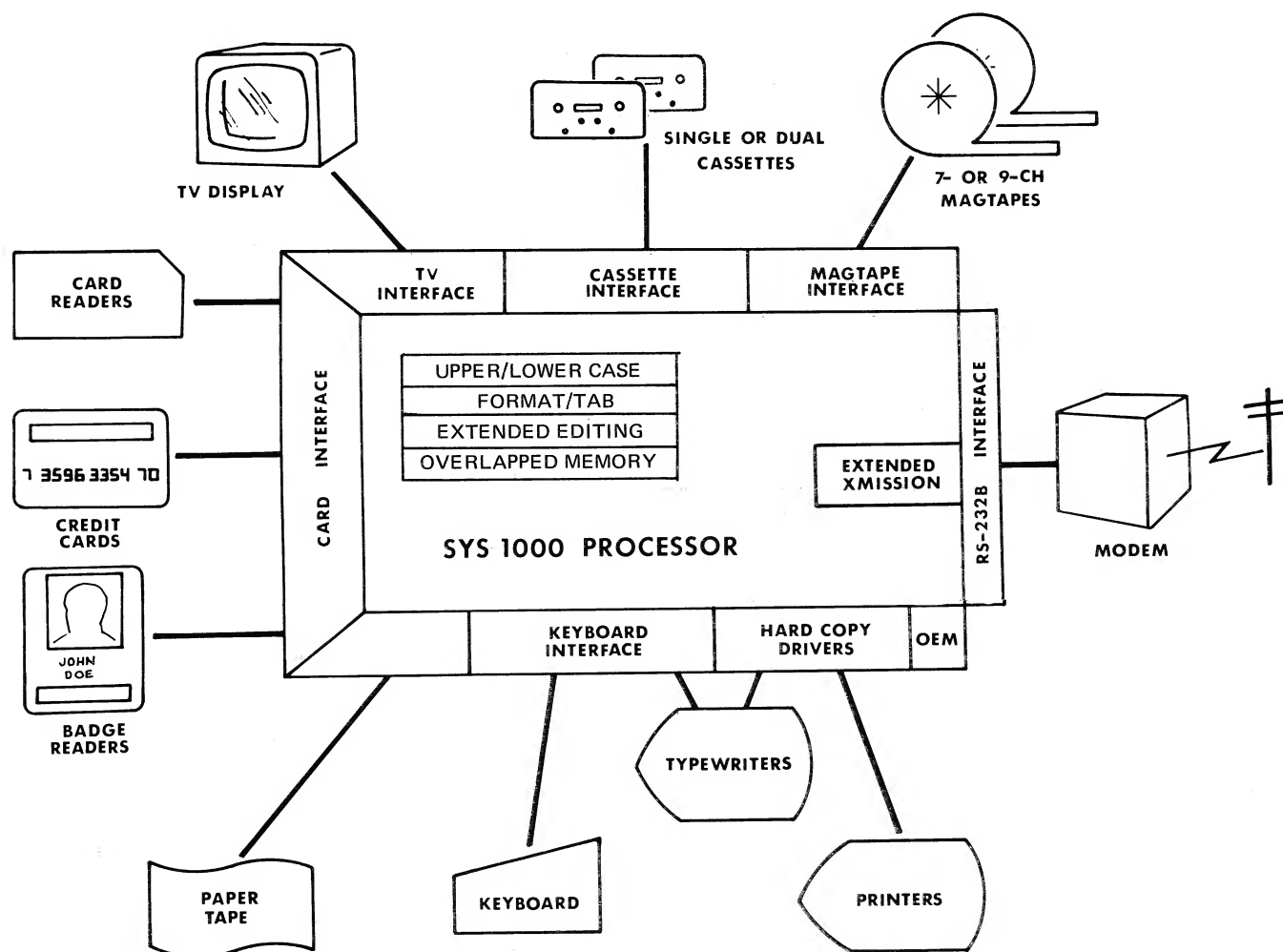
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*Proposed new name of SYS associates, inc.



Applications



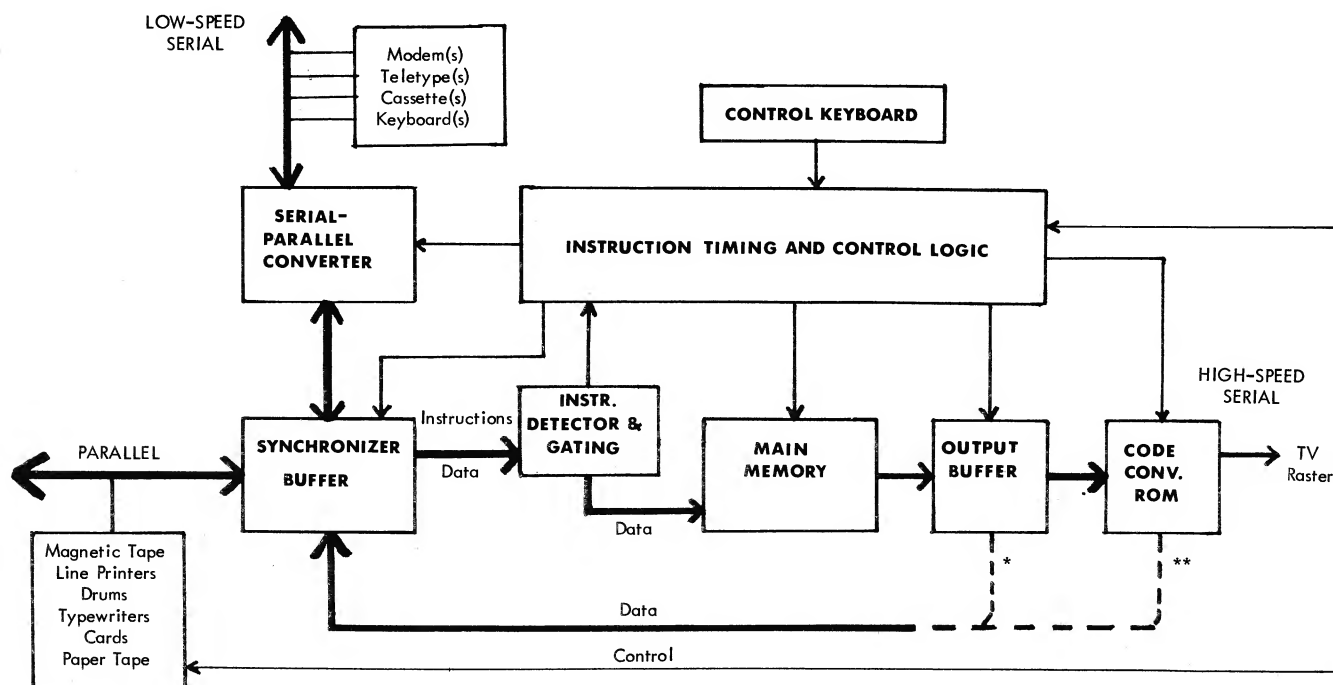
Inquiry/Response CRT Terminals
Teletype-Compatible CRT Terminals
IBM-Compatible CRT Terminals
Key-to-Cassette Devices
Key-to-IBM Magtape Devices
Media Conversion

Poolers (cassette to IBM Magtape
or 7-ch. to 9-ch. Magtape)
Text Editing Office Machines
Batch Data Terminals
Data Concentrators
Magtape or other Peripheral Terminals

Memory

All memory storage in the SYS 1000 consists of MOS shift registers in which data is circulated at the 2-MHz master clock rate. Access time therefore increases with block length; therefore, when high output rates (20 KHz and up) are required the memory is divided into two sectors: an input memory,

which is filled at the input device rate (up to 1800 characters per second) and may be up to 3072 characters long; and an output memory, usually no more than 128 characters long, which writes a line to a TV raster display or a block to a magnetic tape unit at the output rate (up to 2,000,000 characters/sec parallel).



*Any code in...Same code out.....No ROMs required

**Any code in...Different code out....1 ROM required

SYS 1000, Simplified Block Diagram

System Operation

A block diagram of the processor is shown above.

The function of each block is explained below.

SERIAL/PARALLEL CONVERTER: A bidirectional logic group that accepts serial input data from the low-speed serial I/O bus and converts it to parallel format, or accepts parallel data from the processor and shifts it out in serial format. Transfer rate is variable up to 1300 char/sec.

SYNCHRONIZER BUFFER: A bidirectional logic group that accepts parallel data from the S/P converter, the parallel I/O bus, or the processor. This group strips off start, stop, and parity bits from input characters and synchronizes input transfers to the 2 MHz processor clock. The output section provides temporary storage for one character and generates a parity bit.

INSTRUCTION DETECTOR AND GATING: This logic group inspects all incoming data for special characters such as Start of Header, End of Message, remotely generated cursor commands etc. Such special characters generate control command signals that are routed to the instruction control logic section; data characters are stored in main memory at the location specified by the current cursor position.

MAIN MEMORY: The main memory consists of an MOS shift register; in the standard model this is 1024 bits long by 7 bits wide, but larger memories are available as options. The location at which a character is stored or retrieved is

controlled by the addressing section of the instruction control logic, which also causes a cursor to be displayed on units equipped with a TV raster display.

CONTROL KEYBOARD: A group of touch keys that provide cursor control commands, transmit or record commands, etc. When the unit contains an ASCII or Selectric keyboard, the control keys are located in a group adjacent to the alphanumeric keys.

INSTRUCTION TIMING AND CONTROL LOGIC: Contains the processor 2 MHz master clock, a memory addressing section, and logic for interpreting and acting on control commands.

OUTPUT BUFFER: An MOS shift register 128 bits long by 7 bits wide that provides temporary storage for output data and acts as a refresher memory for a TV raster display. If the input and output codes are the same, the parallel output from this buffer is routed directly to the synchronizer buffer for outputting at the device rate (up to 1300 char/sec).

CODE CONVERSION ROM: A read-only memory addressed by the character currently being outputted by the output buffer. In units equipped with a TV raster display, the ROM generates the 5 x 7 dot matrix from which the characters on the screen are formed; a ROM may also be used for converting any code to any other code (e.g., USASCII to EBCDIC, or Correspondence to Teletypesetter, etc.).

Interfacing

Input Characteristics

INPUT LINES

- a. Serial: One Data In line
- b. Parallel: Up to 8 Data In lines
Data Ready line (must be driven high by external device not less than 50 nanosec after data is present on bus)
Data Strobe (200 ± 50 nanosec) accepts and acknowledges parallel input data
- c. Multiple: Several peripherals may be connected to the input lines, but only one device may be operative at any one time. A priority module switch for up to 8 levels of priority is available for parallel input.

LOADING

Each input line presents one standard TTL load to the external device. With the line at logic "1" the external device must supply +40 microamperes; at logic "0" the device must sink -1.6 milliamperes.

TRANSFER RATES

- a. Serial: On-demand up to 1300 characters/sec. As an option, the maximum on-demand rate may be increased at time of order by increments of 1300 char./sec.
- b. Parallel: Same as serial input.
(Low-Speed)
- c. Parallel: In special applications a high-speed parallel
(High-Speed) input rate of up to 2,000,000 char./sec. can be supplied as an option.

Code Conversions

The SYS 1000 processor has facilities for character-by-character code conversion. Converters for translation between any two of the following codes are available as off-the-shelf options; details and prices of converters for other codes are available on request from SYS Computer Corp.

Standard Codes: USASCII, EBCDIC, Correspondance, IBM Selectric

Multiple Code Conversion. The SYS 1000 processor normally converts code in one direction only, however, bidirectional code conversion facilities are available at extra cost. When several input devices are used that have inherently different codes, a converter is required at each peripheral and must output a common code (normally USASCII) to the SYS 1000. Conversion of a single input code to multiple output codes presents no problem and can be performed in the SYS 1000 at a slight extra cost for each output code required.

Output Characteristics

OUTPUT LINES

- a. Serial: One Data Out line
- b. Parallel: Up to 8 Data Out lines
Data Ready line (goes high when output data is presented on Data Out lines)
Data Accepted line (must be driven high by external device after output data is read)
- c. Multiple: Several peripheral devices may be connected to the output lines, and may be selected by pressing control keys on the control keyboard. As an option, an address word at the head of a block of input data may perform the selection.

DRIVING CAPABILITY

Each output line can drive up to 10 standard TTL loads (for definition, see the input Loading characteristics).

TRANSFER RATES

- a. Serial: On-demand up to 1300 characters/sec. As
(Low-Speed) an option, maximum on-demand rate may be increased at time of order by increments of 1300 char/sec.
- b. Serial: In some applications, a fixed serial output rate
(High-Speed) of up to 14 Megabits/sec is available.
- c. Parallel: Same as Low-Speed Serial output rates
(Low-Speed)
- d. Parallel: A fixed transfer rate of up to 2,000,000
(High-Speed) char./sec. may be specified at time of order.

Signal Levels

Standard TTL logic levels are used throughout the SYS 1000 processor and on all I/O data and control lines. Logic "0" is 0.0 to +0.4 volt, and logic "1" is +2.4 to +3.3 volts. If an external device requires different signal levels, conversion to the required levels in the interface supplied for that device.

Interfaces Available

The following peripheral devices can be supplied complete with interface to the SYS 1000, or the interfaces can be supplied separately:

Teletype ASR 33 or 35	Typewriter (Selectric or other)
Modems (RS-232B interface)	7-channel magtape
Keyboards (ASCII, Selectric, Key Punch, or numeric)	9-channel magtape
TV Raster Display	Cassette magtape
Card Reader	Line Printer
Badge Reader	Paper Tape Reader

Others on request